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ABSTRACTS

from

TRANSACTIONS published in JAPANESE

(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Über die Bestandteile der japanischen Mistel.

I. Isolierung von Arginin.
II. Untersuchungen über Harze.

(SS. 219～229)

Von Yataro Obata.

(Biochemiches Institut der Landwirtschaftlichen Fakultät, Universität Tokio;
Eingegangen am 13. 3. 1941.)

Functional Studies on Soils. (XV～XVI).

(pp. 230～234)

By Misu-Hideo.

(Agricultural Experiment Station, Government General of Tyosen;
Received January 11, 1941.)

Studies on the Chemical Sterilization and Preservation on Fishes and Shellfishes.

(pp. 235～246)

By Sogo Tetsumoto.

(Government Institute for Infections Diseases, Tokyo Imper. Univ.;
Received Nov. 8, 1941.)

I performed this experiment to examin the effect of chemical sterilization and preservation on raw fishes and shellfishes.

Details of the study I will report on the next paper.

On Amino Acids in Saké.

(pp. 247～251)

By Yasuji TADA and Toraji TUKAHARA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received March 24, 1941)

The Effect of the Amount of Food Consumed in Animal Experimentation.

(pp. 252～254)

By Isa NAKAMURA.

(Division of Animal Nutrition, University of Illinois(1); Received for
Publication March 25, 1941.)

The amount of food consumed by experimental animals has profound influence upon the production and cure of anemia, the basal metabolism of growing rats, calcification of bones, production of polyneuritis on a thiamin deficient diet, etc. Hence it is imperative to control food intakes of experimental animals in a good experiment.

(1) On leave of absence from September 1, 1940 to August 31, 1941.

Biochemical Studies on Glutathione. Report XVI.

(The Glutathione Content in Organ Tissues in Starvation.)

(pp. 255～262)

By Masayoshi OGAWA.

(Department of Nutrition, College of Medicine, Nippon University;
Received March 12, 1941.)

In the present communication the author reported on the determination of the glutathione content (GSH, GS–SG) in various organ tissues such as liver, kidney, spleen, lung and heart.

For the experimen the employed several albino rats weighing about 200 gms which have been starved during 5, 10.8, or 14 days.

The results obtained are shown in the following table.

Glutathione content in organ tissues (mg %).

		Control	Starved for 5 days	Starved for 10.8 days	Starved for 14.0 days
Liver	Weight (g)	8.07	5.54	5.05	4.25
	GSH	254	186	219	190
	GS-SG	82	89	103	77
	Total	336	275	322	292

Kidney	Weight (g)	1.74	1.41	1.28	1.31
	GSH	200	202	194	178
	GS-SG	29	33	32	29
	Total	230	235	226	207
Spleen	Weight (g)	0.54	0.39	0.39	0.30
	GSH	184	181	190	169
	GS-SH	63	68	62	48
	Total	247	249	252	217
Lung	Weight (g)	1.55	1.49	1.37	1.09
	GSH	103	90	91	87
	GS-SH	30	22	10	11
	Total	133	112	101	98
Heart	Weight (g)	0.83	0.68	0.72	0.68
	GSH	109	101	105	101
	GS-SG	17	25	16	2
	Total	126	126	121	103

As shown in the above table the GSH content in the kidney, lung, heart and the GS–SG content in lung are gradualy decreased, whereas the GSH and GS–SG content in the liver, spleen and the GS–SG content in heart are at first somewhat increased at the initial-middle period of the starvation and then decreased.

The Utilization of the By-Products of Soy-beans. (Part VI.)

On the Hydrolysis of Stachyose.

(pp. 263～268)

By Yosaburo Iwasa.

(Dept. of Food Chemistry, Osaka Municipal Hyg. Lab.;
Received February 26, 1941.)

Über den Mechanismus der Enzymwirkungen.

(SS. 269～281)

Von Yukihiko Nakamura und Kakomu Satow.

(Institut für Landwirtschaftliche Chemie, Landwirtschaftliche Fakultät der Kaiserlichen Hokkaido Universität; Eingegangen am. 22. 2. 1941.)

Im Jahre 1927 hat Nakamura eine Gleichung der Enzymwirkungen abgeleitet, nämlich

$$k=\frac{1}{t^{k'}}\cdot\frac{x}{a(a-x)}.$$

aber die Bedeutung der Konstante k' wurde von ihm nicht erklärt.

Die Verfasser haben die jetzigen Untersuchungen unternommen, um die Bedeutuug dieser Konstante k' zu erklären. Sie haben Diastase, Pepsin und Trypsin als Enzym und Stärke und Casein als Substrat gebraucht. Die Hydrolyse der Substrate wurden durch Veränderungen der Versuchstemperaturen, der Wasserstoffionenkonzentrationen der Lösungen, der Enzymmengen und der Substratmengen durchgeführt. Die Werte von k und k' wurden mittels der Methode der kleinsten Quadrate berechnet.

Es wird bemerkt, daß eine reziproke Beziehung zwischen k und k' vorhanden ist, d. h. wenn k größer ist, ist k' desto kleiner. Nach der Meinung der Verfasser ist k' eine Konstante, die eine Beziehung zur Inaktivierung des Enzymes hat. Die Größe von k' muß zu der Größe der Inaktivierung des Enzymes eine direkte Beziehung haben.

Influence of Monochromatic Lights on the Action of Enzymes. (Report XXXIV～XXXVI).

(pp. 282～290)

By Reitaro Murakami.

(Agricultural College, Utunomiya; Received February 19, 1941)

A quartz mercury lamp was used to investigate the influence of the visible monochromatic lights on the action of the saccharase, amylase and proteinase in the yeast.

The enzyme solutions containing caeh substrate were irradiated througth the layer of copper sulphate solution and the monochromatic filters of red, green, blue and violet, each passing no ultra and infra-red rays. Colorless and black filters passing respectively all visible and no rays were also used for controls.

The preparation of the enzymes, the measurement of the enzyme action and the other treatments were the same as in the author's previous papers(1).

In this experiment, the actions of yeast saccharase, amylase and proteinase were promoted by the visible monochromatic lights. The effect of monochromatic lights on the actions of these enzymes was found to be more pronounced with the wave number as in the author's previous report(1).

(1) Bull. Agri. Chem. Soc. (Japan), **16**, 55～68, (1940).

On the Chemical Studies of the Bagass-pulp.

(pp. 291～294)

By Tetutarō Tadokoro and Keizō Ito.

(Hokkaido Imperial University; Received March 22, 1941.)

Studies on the Hydrolysis of Proteins at High Temperature and Pressure (I)

(pp. 295～299)

By Kenzo Nakajima and Masami Ikeda.

(Reserach Institute of Honen Oil Co., Ltd.; Received March 18, 1941.)

The hydrolysis of soybean protein, casein and gelatine at high temperature and pressure was studied.

One hundred grams of soybean protein and 300 cc water were put into a stainless steel cup of 500 cc capacity and mixed well. The cup was then set in an autoclave. After the pressure had been raised up to a certain point by pumping air into the autoclave, the temperature was raised electrically up to a certain point. It took about one hour to raise the temperature up to 150°C from room temperature. After both temperature and pressure had been raised to the points determined upon conditions were maintaind in this state for a given time, at the end of which the heating was stopped. The autoclave was allowed to cool by itself. When the temperature of the sample had fallen to 95～100°, it was taken out from the autoclave. The amino nitrogen and ammonia were determined as given in Table I.

Table I. Amino and ammonia nitrogen of soybean protein hydrolysed at high temperature and pressure

Initial pressure (atm.)	Decomp. temp.	Pressure (atm.)	Time keeping temp. and press. (hrs.)	Soluble N (%)	Amino N (%)	Ammonia N (%)	Amino N + Ammonia N (%)
20	155°+5°	38	4	75.58	10.65	13.22	23.87
35	160°±5°	62	5	82.09	11.32	20.85	32.17
50	140°±5°	76	4	79.23	10.49	20.33	30.82
50	185～195°/±5°	100	4	—	17.44	30.44	47.84
65	100°±5°	85	4	38.37	9.11	8.03	17.14
70	170°±5°	120	4	74.46	14.11	23.24	37.35
85	170°±5°	150	4	74.13	13.21	26.17	39.38
100	170°±5°	185	4	70.75	20.88	30.63	51.51

From the hydrolyte obtained at 170°±5° and 110 atm., substances of albumose and peptone types were fractionated.

A colouring matter of melanine type was precipitated from the hydrolyte when the solution was acidified at pH 2.0. This colouring matter was very slightly soluble in 50% ethyl alcohol, and seemed to be insoluble in ethyl ether, carbon tetrachloride, toluol, xylol, amyl alcohol or carbon bisulfide. The elementary analysis gave the following data.

Table II. Elementary composition of the colouring matter

C	54.74 %	H	6.95 %	N	11.57 %	O	27.10 %

The colouring matter was completely hydrolysed with 20% HCl. The content of each type of nitrogen in the hydrolyte is given as follows:

Table III. Distribution of nitrogen in complete hydrolyte of the colouring matter

Ammonia nitrogen	10.89%	Amino nitrogen of ditto	19.77%
Humin nitrogen	50.18	Diamino acid nitrogen	7.08
Monoamino acid nitrogen	31.85	Amino nitrogen of ditto	2.03

From the filtrate of the colouring matter, proline (picrate), leucine and isoleucine (copper salt), phenyl alanine, oxyglutamic and glutamic acids, aspartic acid, arginine (silver salts) were obtained.

Casein, gelatine and soybean protein were compared as regards decomposition at 170°±5° under 65 atm. pressure. Amino nitrogen and ammonia were determined as given in Table IV.

Table IV. Ammonia and amino nitrogen in the hydrolytes of casein, gelatine and soybean protein

	Total hydrolyte (cc)	N in hydrolyte of 100 cc (%)	Amino nitrogen		Ammonia	
			(g)	(%)	(g)	(%)
Casein	335	3.3356	0.3453	10.35	0.8108	24.31
Gelatine	350	3.5708	0.5927	16.60	0.8238	23.07
Soybean protein	350	3.0731	0.4336	14.11	0.7213	23.27

The nitrogen content of each colouring matter precipitated at pH 2.0 from 100 g of each hydrolyte was determined as given in Table V.

Table V. Nitrogen content and yield of the colouring matter

	Colouring matter obtained from 100 g of hydrolyte (g)	N of colouring matter (%)
Casein	14.66	11.90
Gelatine	10.83	12.14
Soybean protein	10.91	11.57

The Fat Metabolism of the Mold Fungi. (1).

(The Fat formation by *Penicillium javanicum* cultured on the sugar cane juice.)

(pp. 300~306)

By Shinichi Suzuki.

(Government Sugar Experiment Station, Tainan, Taiwan, Japan;
Received March 27, 1941.)